

WCSC 2015: the World Chess Software Championship

Article

Published Version

Krabbenbos, J., van den Herik, J. and Haworth, G. (2015)
WCSC 2015: the World Chess Software Championship. ICGA
Journal, 38 (2). pp. 114-122. ISSN 1389-6911 Available at
<https://centaur.reading.ac.uk/39962/>

It is advisable to refer to the publisher's version if you intend to cite from the work. See [Guidance on citing](#).

Publisher: The International Computer Games Association

All outputs in CentAUR are protected by Intellectual Property Rights law, including copyright law. Copyright and IPR is retained by the creators or other copyright holders. Terms and conditions for use of this material are defined in the [End User Agreement](#).

www.reading.ac.uk/centaur

CentAUR

Central Archive at the University of Reading

Reading's research outputs online

WCSC 2015: THE 4TH WORLD CHESS SOFTWARE CHAMPIONSHIP*Jan Krabbenbos, Jaap van den Herik, and Guy Haworth²*

Amersfoort, Leiden and Reading

WCSC 2015 continued the sequence of tournaments designed to pit authors' chess engines against each other on identical hardware platforms. It was held after WCCC 2015 on the 4th-5th of July and all WCCC programs except THE BARON participated, see Table 1. The tournament took place at Leiden University and was organized by the ICGA, LIACS and LCDS. The sponsors were Aegon, Museum Boerhaave, the municipality of Leiden, Leiden University, ICGA, iSSC, SurfSara, Digital Game Technology and NWO. It was held in conjunction with the 18th Computer Olympiad and the 14th Advances in Computer Games conference. Moreover, special lectures for the general public on intelligent programs for rowing, football and the game of Diplomacy were given. Additional sponsors were therefore the Faculty of Science, the Royal Dutch Rowing Federation and Dutch Angle.TV.

The common platform was a 4-core Intel i7 processor supporting a potential 8 threads of activity and having no internet access. The game tempo was 'all/45' + 15"/move'.

	Program	Author(s)	Country	Operator
1	FRIDOLIN	Christian Sommerfeld	DE	Christian Sommerfeld
2	GINKGO	Frank Schneider	DE	Ingo Bauer
3	HIARCS	Mark Uniacke	GB	Harvey Williamson
4	JONNY	Johannes Zwanzger	DE	Johannes Zwanzger
5	KOMODO	Don Dailey, Larry Kaufman & Mark Lefler	USA	Mark Lefler & Erdogen Günes
6	MAVERICK	Steve Maughan	USA	Steve Maughan
7	PROTECTOR	Raimund Heid	DE	Timo Haupt
8	SHREDDER	Stefan Meyer-Kahlen	DE	Stefan Meyer-Kahlen

Table 1. The authors, operators and programs of the WCSC 2015.

The 28 games of the round-robin (11 White wins, 13 draws and 4 Black wins) and the 4 games of the play-off (3 draws and one Black win) can be consulted on the web as played (ICGA, 2015) and also with evolving comments (Krabbenbos et al., 2015b). The biographies of participants and engines are referenced in (Krabbenbos et al., 2015a).

R1: KOMODO–JONNY 1-0, GINKGO–PROTECTOR ½-½, SHREDDER–MAVERICK 1-0, HIARCS –FRIDOLIN 1-0.

The spectators of the game KOMODO–JONNY were well aware that the tournament's platform constraint particularly handicapped WCCC champion JONNY and wondered what effect this would have. In the WCCC it played with 2400 cores and in this tournament it had only 4 cores supporting 8 threads - quite a difference. After a quiet opening, the middle game required the full attention of both sides. KOMODO had the initiative but JONNY reacted accurately, at least in the beginning. However the dilemma of choice occurred and in some cases JONNY did not have enough time to compute the consequences of the options. It resulted in some wrong choices which brought it to an awkward position (Figure 1a). KOMODO did not have any compassion for its opponent. It played **38. Ng5+** and, after **38. ... fxe5 39. Re5**, it counted out JONNY on move 45. The first defeat of the new world champion even if in another mode.

GINKGO–PROTECTOR was a Queen's Gambit Accepted in which White aimed for activity in a dynamic position. For this purpose it sacrificed a pawn which it believed would be regained after some time. Indeed, this idea came to fruition. But at that time, the game was almost reduced to a rook and pawn ending and, not surprisingly, a draw was agreed.

SHREDDER–MAVERICK was a game in which SHREDDER took the initiative by sacrificing a pawn for chances to attack the black king. MAVERICK defended ingenuously but could not prevent White from winning material. A black passed pawn made a direct win for White difficult so play went on. But in the end SHREDDER overcame all obstacles and won the game.

² jan.krabbenbos@gmail.com, jaapvandenherik@gmail.com and guy.haworth@bnc.oxon.org.

HIARCS–FRIDOLIN was a game in which HIARCS showed how to learn to play chess well. HIARCS made normal moves and waited for FRIDOLIN to take deviations in the wrong direction. They came soon after the opening and as a result HIARCS, taking the initiative and some material, rushed away with such a large advantage that the win soon followed. The completion of the game was easy.

Standings: 1= HIARCS, KOMODO and SHREDDER 1; 4= GINKGO and PROTECTOR $\frac{1}{2}$; 6= FRIDOLIN, JONNY and MAVERICK 0.

R2: KOMODO–GINKGO $\frac{1}{2}$ – $\frac{1}{2}$, JONNY–MAVERICK 1–0, FRIDOLIN–SHREDDER 0–1, PROTECTOR–HIARCS $\frac{1}{2}$ – $\frac{1}{2}$.

The game KOMODO–GINKGO started as an attractive spectacle. However the middle game led to a long and winding endgame. There were no particular opportunities and so the game ended in a draw.

It took more than 40 moves before JONNY was able to obtain any substantial advantage in its game with MAVERICK. Strategic lines dictated the game and that always requires knowledge of the preferences and aims of both sides. Apparently after 40 moves the pieces guided by JONNY were better placed than those of MAVERICK. The real breakthrough came in the endgame where MAVERICK lost its grip totally on the position. JONNY won convincingly.

If we could allow a program part of a point for adequate resistance, FRIDOLIN would be a candidate. It played well and only succumbed at the end of the session. Another perspective is that SHREDDER played an easy game as FRIDOLIN was happy with the position of being not as good as SHREDDER. Even computer chess programs follow psychological lines such as acquiescence, accepting reality. So it was here: FRIDOLIN had to accept a loss against SHREDDER.

PROTECTOR–HIARCS was a spectacle in itself. Immediately after the opening the players were fighting mano a mano. The level of computer play is nowadays so high that the programs have a good feeling for the compensation which is needed when sacrificing the exchange. Probabilities of the realisation of winning chances play an important role. Since this holds for both sides one should not be surprised that spectacular games can also end in a draw. After 24. **Rxd5+**, see Figure 1b, the two white bishops came to life and changed their position from the queenside to the kingside. There they could keep the hostile king under attack. However this was all that resulted from the sacrifice and in the end position, nothing more than perpetual check, and consequentially a draw, could be reached.

Standings: 1 SHREDDER 2; 2= HIARCS and KOMODO $\frac{1}{2}$; 4= GINKGO, JONNY and PROTECTOR 1; 7= FRIDOLIN and MAVERICK 0.



Figure 1. (a) R1 KOMODO–JONNY after 37. ... **Rg8**,
(b) R2 PROTECTOR–HIARCS after 23. ... **Nd5**, and (c) R3 MAVERICK–FRIDOLIN after 21. **c3**.

R3: MAVERICK–FRIDOLIN 1–0, GINKGO–JONNY $\frac{1}{2}$ – $\frac{1}{2}$, SHREDDER–PROTECTOR $\frac{1}{2}$ – $\frac{1}{2}$, HIARCS–KOMODO $\frac{1}{2}$ – $\frac{1}{2}$.

MAVERICK–FRIDOLIN was a game which, in the last century would have prompted the cry “Avanti, Avanti!” Black fianchettoed its king’s bishop and White took the opportunity to run with the h-pawn as fast as possible and take on g6 meanwhile trying to penetrate the black position along the h-file. The culmination of this attack was 21. **c3**, see Figure 1c: Black is not allowed to take the white bishop on d3 because of 22. **Bxf6**.

The game continued, White persisting in trying to open up the position to its advantage. However Black defended quite well and was able to counter all attacks up to move 60. Then the table turned and Black was in trouble. After **64. Bc4**, the move 64. ... Qf6 is impossible because of 65. Qxg8+. Given this, Black lost a pawn, a second pawn and even a third. So in the end White won convincingly.

The game GINKGO–JONNY had a Semi Slav opening which turned out to be a popular choice in this tournament. Black usually tries to take the initiative by playing very actively. However if White reacts adequately, it has nothing to fear and black's attempts result in an uncomfortable position. This was precisely the feeling JONNY had when considering move 23, Figure 2a. Finally the program decided on **23. ... Bc8**.

It had seen 26 plies ahead with some extensions here and there. It found a draw by perpetual check and believed this to be the best result the program could reach from the current position. So for JONNY, everything that happened was seen in advance. For human beings replaying the game it is an exciting game. JONNY is offering a piece on h5 and then it is offering a piece on f5 - and all spectators are looking for the winning attack which is not there. Finally JONNY is sacrificing the exchange. Then for the public it is a surprise, but for JONNY a logical result, that the game ends with perpetual check. Black was down a rook and a piece but had seen all in advance. The thinking of the current WCCC champion is really impressive.

SHREDDER–PROTECTOR started as a Ruy Lopez. They followed a main variation, not the real main line. The motives were well known and the exchanges of pawns and pieces led to a pattern that had appeared earlier in Ruy Lopez games. Right from the opening they found a repetition of moves which both sides considered to be the best variation available. So, a draw was agreed.

The game HIARCS–KOMODO started as a Queen's Gambit Accepted. The best characterization of the game is almost similar to the characterization of the game above. The motifs were well known and the piece sacrifice for a handful of pawns made Black alert and somewhat risk-averse. In what happened it is clear that Black understood what it could do best and that was to allow perpetual check.

Standings: 1 SHREDDER 2½; 2= HIARCS and KOMODO 2; 4= GINKGO, JONNY AND PROTECTOR 1½; 7 MAVERICK 1; 8 FRIDOLIN 0.

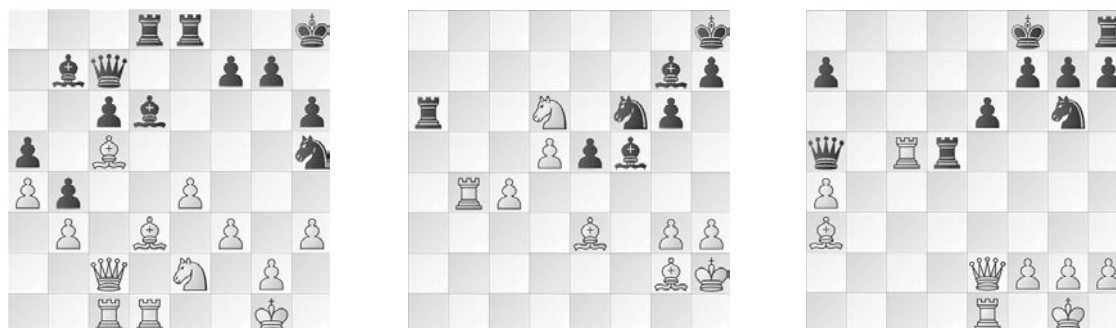


Figure 2. (a) R3 GRINKGO–JONNY after **23. Bc5**,
(b) R4 JONNY–FRIDOLIN after **45. Nxd6**, and (c) R4 PROTECTOR–MAVERICK after **25. Rxc5**.

R4: JONNY– FRIDOLIN 1-0, PROTECTOR– MAVERICK 1-0, KOMODO–SHREDDER ½-½, GINKGO–HIARCS ½-½.

In human terms, people would say FRIDOLIN is a promising player as it knows the main patterns that apply in a King's Indian game. It was expected that FRIDOLIN would lose against the new world champion. In the beginning, FRIDOLIN lost a few tempi but this loss did not make its position very bad. The chances for White were clearly present and counter play was dangerous. So, JONNY had to compute what plan to follow diligently and accurately. For humans it is nice to see the complications but we should take into account that JONNY had seen them up to a considerable depth. A nice example is **45. Nxd6**, see Figure 2b.

In the early years of computer chess development, researchers spoke many times of the horizon effect. Now humans will speak about the horizon effect as it applies to them since the computers by far out-search the human view of the game. JONNY had seen everything and won deservedly.

In PROTECTOR–MAVERICK, there was no discussion of the outcome. PROTECTOR was clearly the better player. In the transition from opening to middle game, it took the initiative and soon had the advantage. The question of how to materialize the advantage was solved rather easily. Even so, an interesting problem, a challenge to both silicon and carbon players, had to be addressed when both programs considered the position after White's move **25. Rxc5**, see Figure 2c. Both recaptures will result in loss. Humans definitively would recapture with the rook and so would STOCKFISH, the authors' advisor here. However both programs PROTECTOR and MAVERICK believed that taking with the queen was preferable. For commentators, programmers and spectators it was a surprise. The choice of move did not alter the final outcome: a win for White.

In the game KOMODO–SHREDDER, the programs left the opening book quite early. Finding the right moves in a closed position is difficult with respect to future development. White played somewhat reluctantly, giving Black the opportunity to employ some subtleties. Black gratefully took this chance, won a pawn on the queenside and had a clear advantage there. So for White it was important to have counterplay on the kingside. On move 36, Figure 3a, it saw a chance by sacrificing a bishop for a handful of pawns.

After **36. Bxf6**, **37. Qxh6** and **38. Nxf6**, Black's king was unprotected on the back rank. The sequence of checks was continuous and so a draw was agreed.

GINKGO–HIARCS was again a Semi Slav opening. Both sides were fighting from the beginning with the themes White active on the kingside, Black active on the queenside. In the middle game, the focus was on exchanging the pieces and obtaining opportunities for the passed pawns. In the transition from middle game to endgame it was fascinating to see how White combined prohibiting the progress of Black's pawns with supporting the progress of its own pawns. The position after **41. ... Bb5**, Figure 3b, is a telling example. White had to decide between **42. h5** and **42. Nxd4**.

The choice was **42. h5** to which Black responded **b3**. The variation looked double edged but it turned out that White had the better chances. The game went on for another 20 moves but White did not give away any of its advantage and won the game convincingly.

Standings: 1 SHREDDER 3; 2= GINKGO, JONNY, KOMODO and PROTECTOR 2½; 6 HIARCS 2; 7 MAVERICK 1; 8 FRIDOLIN 0.



Figure 3. (a) R4 KOMODO–SHREDDER after **35. ... f6**,
(b) GINKGO–HIARCS after **41. ... Bb5**, and (c) R5 HIARCS–JONNY after **15. Bxa8**.

R5: MAVERICK– KOMODO ½-½, HIARCS– JONNY ½-½, SHREDDER–GINKGO ½-½, FRIDOLIN–PROTECTOR 0-1.

The surprise of this round was the draw by MAVERICK against KOMODO. The real winner of that game was the white bishop who started its career on f1. During the game, it was the supporter of the white knight and the white rook which recaptured important pawns on c4 and e6. KOMODO tried to complicate matters but MAVERICK played with courage and brains. For every challenge it had a solution. Only at the very end was MAVERICK slightly tricked by KOMODO. First it had to give up its passed d-pawn and thereafter the exchange for a pawn. However at that point in time, the material was so far reduced that the draw was not in danger. At the end of the game KOMODO performed a tribute of honor by sacrificing its rook for a pawn and leading MAVERICK into an endgame with an edge-pawn and wrong-colored bishop. Indeed, the white bishop on f1 is the boss of only 32 white squares and so could not support its h-pawn to promotion. Still, the draw against KOMODO is a real tribute to the playing strength of MAVERICK.

It is remarkable how the value of an exchange goes up and down in the evaluation of chess positions. Being an exchange up is normally considered an advantage. However in many games in this world championship, it looks like sacrificing the exchange has been an advantage. In the game HIARCS–JONNY, Black sacrificed its rook on a8 for the white fianchetto'd bishop. Moreover the white position had some weak pawns, targets for capturing.

With two well positioned knights, Black had many threats to hand. However White was alert and prepared a nice counter attack. It entered the Black position on f7 to the surprise of the black king. The hidden trick of **20. Nxf7** was in the following unexpected line: 20...Rxf7 21.Qd8+ Rf8 22.Rxf8+ Bxf8 23.Bxc3 Qxc3 24.Rf1 Qxe3+ 25.Kh1 Qe4+ 26.Kg1 Qe3+ draw. Black therefore chose another line with **20. ... Nbd5**. The game continued with some exchanges and a counter-sacrifice of the exchange by White. Subsequently more pieces and pawns were exchanged and finally White decided to deliver perpetual check. A nice game and a well- deserved draw. In retrospect the players were asked whether they had seen any improvements in the play. They answer unanimously: White should have played 11. Bb2 instead of **11. Ng5**.

The game SHREDDER–GINKGO started as a Sicilian game with the variation as introduced by Najdorf. Soon the programs followed their own plans and ideas which were certainly not in favor of SHREDDER. Black developed pressure on the queenside where the white king was welcoming the penetrators. After **26. ... Nc3**, Figure 4a, White found itself in an awful position that became a lost position. For instance, the black knight on c3 can capture the pawn on a2 at any time.

Yet Black could not find a suitable plan to improve its winning position and collect more substantial advantages. It was a won position and even became a clearly won position but it was never a definitely won position. Some people might believe there is a way to challenge White, hoping that it will kill itself. White refused to do so and was waiting for an opportunity to counter attack. And all of a sudden after **46. g5**, Figure 4b, the evaluation function began to rise.

This trend continued and after some time, White had some hopes of a draw. Ten moves later this was realized as expected: a half-point for both sides then. Although SHREDDER was still in the lead, it did not play like a future champion in this round. Surprisingly, GINKGO had kept its chances of the title.

The game FRIDOLIN–PROTECTOR had a Sicilian origin. White played the Prins variation with **5. f3** and saw that its opponent was a connoisseur of this opening. Black took the initiative, advanced its pawns and placed its pieces on the appropriate squares. Soon the majority of the territory was in Black's hands. Of course White tried to escape from Black's clutches but it was in vain. Here again we saw a sacrifice of the exchange but it did not change the general picture of the game. Black won convincingly.

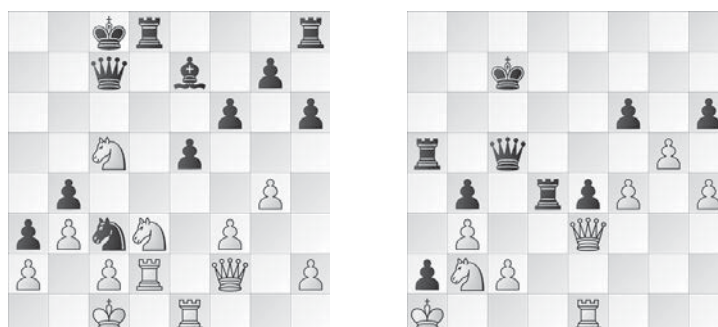


Figure 4. R5 SHREDDER–GINKGO after (a) **26. ... Nc3** and (b) **46. g5**.

Standings: 1= PROTECTOR and SHREDDER 3½; 3= GINKGO, JONNY and KOMODO 3; 6 HIARCS 2½; 7 MAVERICK 1½; 8 FRIDOLIN 0.

R6: KOMODO–FRIDOLIN 1-0, HIARCS–SHREDDER ½-½, JONNY–PROTECTOR ½-½, GINKGO–MAVERICK 1-0,.

The game KOMODO–FRIDOLIN opened with the unusual **1. d4, 2. Nc3**. It was not sufficient to enable White to obtain an advantage from playing the first move. FRIDOLIN achieved a fully equal game. However reaching an equal game is one thing, bringing an equal game to an end is another. KOMODO had to work very hard in the endgame to see any pursuable chances. Still, chess is a complex game and sometimes opportunities seem to come out of the blue. One such was taken by KOMODO and it won as expected by laymen and experts.

HIARCS–SHREDDER followed a Sicilian opening, Taimanov variation. Both players creatively inserted their own ideas into the design of their configuration. It is always a dance around subtleties containing details that are very difficult to prove valuable and reliable. Play continued on an equal footing. Still, after the move **13. ... Bd6** White was facing three opportunities. 14. e5, Bc5 or Rxd6. An important characteristic of this position is the bad location of the knight on h5: f4 followed by Be2 is the main threat in this respect.

In the game, White played **16. Bc5** and after many exchanges the game ended in a draw. With this move, White missed an excellent opportunity, namely 14. Rxd6. An example of the consequences according to STOCKFISH is: 14. ... Qxd6 15. e5 Qc7 16. f4 c5 17. Bxc5 Bb7 18. Rg1 Rfc8 19. Bb4 Rd8 20. Bd3 Qc6 21. Kb1 Qf3 22. Qxf3 Bxf3 23. Rf1 Bg2 24. Rf2 Bb7 25. Be7 Re8 26. Bd6 g6 27. Rf1 Rac8 28. Be2 Ng7 29. a4 bxa4.

JONNY–PROTECTOR was essentially a game with one theme. JONNY had the initiative: it tried to broaden, widen and finally deepen this initiative. PROTECTOR was ‘back to the wall’ but considered the wall to be its companion and protector. From that position, it was able to fight back and JONNY saw that its attempts to gain the advantage were all in vain. In human chess this is a psychologically difficult position as humans start to overestimate their possibilities but that is not what JONNY did. It continued to play strongly but maybe it did not play the strongest moves in this phase. It did not reach any tangible advantage, the pressure went away and the normal position that remained was easy to play to a draw. After 111 moves, this expectation was realised. Both programs were satisfied with their result.

The game GINKGO–MAVERICK was a King’s Indian. Both sides followed well-known paths. The first real decision was **20. ... cxd5**, possibly not the best move as Black opens the position which in the longer term is to the advantage of White. 20. ... c5 would also be a bad choice but maybe 20. ... b6 is better.

As the game continued, we saw that Black did not take the opportunity to take the rook on f1. The reason was given by STOCKFISH: 23. ... Nxf1 24. Bb6 Rc7 25. Kxf1 Nc8 26. Bxa5 Bf6 27. Bxc7 Qxc7 28. Nb2 Nb6 29. Bb5 Rc8 30. Bxd7 Qxd7 31. a5 Na8 32. Nc4 Rd8 33. Qf2 Nc7 34. Qb6 Ne8 35. Ra1 Ra8 36. Qb4 Qe7 37. Nb5 Kg8 38. Kg1 Rd8 39. a6 bxa6. As the game went on, White was able to increase the pressure on the black position: this was exerted on the c-file and on the queenside and felt in the core of Black’s position on the sixth rank. Black resisted as much as possible but it was a lost cause and after move 52, it resigned.

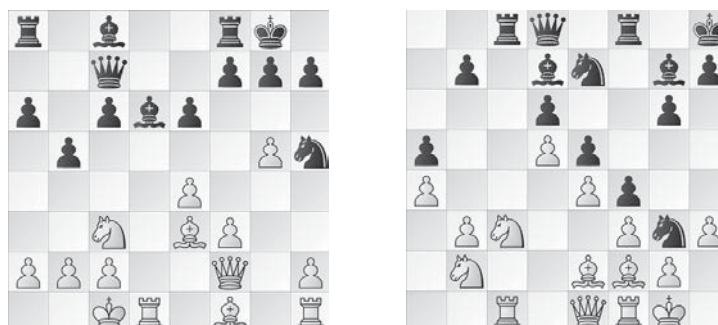


Figure 5. R6 (a) HIARCS–SHREDDER after **13. ... Bd6** and (b) GINKGO–MAVERICK after **22. ... Ng3**.

Standings: 1= GINKGO, KOMODO, PROTECTOR and SHREDDER 4; 5 JONNY 3½; 6 HIARCS 3; 7 MAVERICK 1½; 8 FRIDOLIN 0.

R7: SHREDDER–JONNY 1-0, FRIDOLIN–GINKGO 0-1, MAVERICK–HIARCS 0-1, PROTECTOR–KOMODO ½-½.

The last round was an exciting round as four programs had the opportunity to share first place. We focus first on the results that were the most important, namely the win for SHREDDER over JONNY and the win by GINKGO against FRIDOLIN. SHREDDER–JONNY was a complex game in which both sides tried to outmanoeuvre the opponent. Originally SHREDDER had the initiative and JONNY had to find the appropriate defense. After that phase, JONNY tried to dictate the course of the game by becoming active on the kingside. It did not help as SHREDDER was prepared and the half-open c-file was a precious asset for its plans. The odds went up and down although they seemed to be indicating a drawish game. As stated earlier, the devil is in the details and SHREDDER turned out to be a very precise collector of small advantages which influenced the final outcome. In the endgame, all the white pieces turned out to be on the right squares and suddenly the black position collapsed. So the new WCCC champion lost to an old WCCC champion.

FRIDOLIN faced a tough opponent in GINKGO so it played quite modestly in the hope of keeping the position even. As we all know, that is not easy in chess. In this game we saw GINKGO pressing on the configuration built by White. It was a matter of indirect exchanges of pieces and rooks. Of course there is always the choice not to follow the indirect exchanges: the question is what is better and what is best. In the game it looked for a long time like FRIDOLIN could hold itself but finally it was knocked out by a mating threat created by Black. To avoid mate, White had to sacrifice the exchange and after that the game was soon over.

The game MAVERICK–HIARCS was a standard game in which the better player had to find the weak spots in White's position. Such weak spots are mostly created by the players themselves. The difficulty in chess is that different rules apply. That also holds for handling difficult positions. Obviously MAVERICK made some bad decisions and HIARCS was well prepared to seize the opportunities. It realized its advantage and won the game without any excitement.

PROTECTOR–KOMODO was a tough game for both combatants. Both showed aggressive intentions and alternated between aggressive and defensive moves. To remain aggressive, Black sacrificed the exchange and saw its activity as very good compensation for the material loss. Yet the balance was never restored and so White could still hope to bring the turbulence of the game to calmer water and then exploit the possession of rook against bishop. The pawn compensation of Black made it difficult for White to realize what it had in mind. The tricks from both sides were well balanced and the draw was an appropriate outcome.

Standings: 1= GINKGO and SHREDDER 5; 3= KOMODO and PROTECTOR 4½; 5 HIARCS 4; 6 JONNY 3½; 7 MAVERICK 1½; 8 FRIDOLIN 0.

#	Program	r1	r2	r3	r4	r5	r6	r7
1	GINKGO	4w½	3b½	6w½	5w1	2b½	7w1	8b1
2	SHREDDER	7w1	8b1	4w½	3b½	1w½	5b½	6w1
3	KOMODO	6w1	1w½	5b½	2w½	7b½	8w1	4b½
4	PROTECTOR	1b½	5w½	2b½	7w1	8b1	6b½	3w½
5	HIARCS	8w1	4b½	3w½	1b0	6w½	2w½	7b1
6	JONNY	3b0	7w1	1b½	8w1	5b½	4w½	2b0
7	MAVERICK	2b0	6b0	8w1	4b0	3w½	1b0	5w0
8	FRIDOLIN	5b0	2w0	7b0	6b0	4w0	3b0	1w0

#	Program	r1	r2	r3	r4	r5	r6	r7
1	GINKGO	½	1	1½	2½	3	4	5
2	SHREDDER	1	2	2½	3	3½	4	5
3	KOMODO	1	1½	2	2½	3	4	4½
4	PROTECTOR	½	1	1½	2½	3½	4	4½
5	HIARCS	1	1½	2	2	2½	3	4
6	JONNY	0	1	1½	2½	3	3½	3½
7	MAVERICK	0	0	1	1	1½	1½	1½
8	FRIDOLIN	0	0	0	0	0	0	0

Tables 2 and 3. The WCSC 2015 game results and standings, round by round.

#	Program	G	S	K	P	H	J	M	F	W	D	L	Score	S-Bgr
1	GINKGO		½	½	½	1	½	1	1	3	4	0	5	14.25
2	SHREDDER	½		½	½	½	1	1	1	3	4	0	5	14.00
3	KOMODO	½	½		½	½	1	½	1	2	5	0	4½	13.50
4	PROTECTOR	½	½	½		½	½	1	1	2	5	0	4½	12.50
5	HIARCS	0	½	½	½		½	1	1	2	4	1	4	10.25
6	JONNY	½	0	0	½	½		1	1	2	3	2	3½	8.25
7	MAVERICK	0	0	½	0	0	0		1	1	1	5	1½	2.25
8	FRIDOLIN	0	0	0	0	0	0	0		0	0	7	0	0.00

Table 4. The WCSC 2015 cross-table of game results.

The play off. At the end of the round-robin, GINKGO and SHREDDER headed the table. They had drawn the game between them and achieved the same number of wins as White and Black. Had the Sonneborn-Berger tie-breaker been used, GINKGO would have edged first by the smallest margin, 0.25 points. However, the title was to be decided by further games - two at the rapid tempo of 'all/20' + 10"/move' and, if needed, two at the blitz tempo of 'all/5' + 5"/move'.

In the first play-off game SHREDDER had White. In a closed Ruy Lopez, it got the initiative, opening up the black kingside. GINKGO defended well and used its open f-line to launch an attack on White's king. However, SHREDDER found a path to perpetual check and the game ended in a draw. The second game was a Nimzo-Indian in which neither side ventured from drawish territory. After exchanging the pieces, a rook ending with four pawns on both sides appeared on the board. White had a small threat with a marching pawn that Black easily defended against, almost resulting in repeated positions. However, both sides deviated from the course of perpetual moves and the draw was a matter for agreement.

With the first two play-off games drawn, blitz tempo came into play. GINKGO's operator Ingo Baum was not happy with this after his experiences in the Blitz tournament itself. In the first of these games, GINKGO played a Sicilian opening as White. Far into the middlegame, the position was equal. At **63. Be2** White started to slowly give away its position. This resulted in two black pawns creating havoc and the loss of a piece for White. After that SHREDDER won the game easily. In the second play-off game, GINKGO now had to win to gain equality. SHREDDER played another closed Ruy Lopez as White and gained some positional advantage. However after exchanging the queens the game became drawish and indeed ended as a draw.

So, SHREDDER became the WCSC champion, winning the third game and drawing the fourth. Our congratulations to SHREDDER on another world title, to GINKGO for its valiant second place, to KOMODO and PROTECTOR on their shared third place, and to all the participants for a close contest and many fascinating games.

Comparing the WCCC and WCSC, the common platform was certainly a leveler, increasing WCCC's 28% of draws to 46% and cutting WCCC's 36% of wins with Black to 19% in this WCSC. Here again, almost all games were decided before reaching the 'endgame table zone' where 6-man 'EGT' endgame tables (de Man, 2013; Nalimov et al., 2000) can be consulted by the engines, 7-man DTM EGTs (MVL, 2015) can inform and FINALGEN (Romero, 2012) may inform³ post hoc. Table 5 provides some details.

WCSC			FinalGen					7-man					sub-7-man					Game
#	Game	move	#	men	eval.	value	move	endgame	eval.	value	dtm	ply	move	eval.	value	dtm	ply	result
01	1.2 Sh-B	49b	10	6-4	18.15	?	-	-	-	-	-	-	-	-	-	-	-	1-0
02	1.3 H-F	34b	13	7-6	1.80	?	-	-	-	-	-	-	-	-	-	-	-	1-0
03	1.4 G-P	37b	13	7-6	0.00	?	-	-	-	-	-	-	-	-	-	-	-	=
04	2.1 K-G	42b	16	8-8	-0.11	?	-	-	-	-	-	-	-	-	-	-	-	=
05	2.3 F-S	68b	11	5-6	-2.39	?	-	-	-	-	-	-	-	-	-	-	-	0-1
06	5.3 M-K	67b	7	4-3	-1.68	=	67b	KBPPKRP	-1.68	=	=	89	112w	0.01	=	=	5	=
07	5.4 Sh-G	-	-	-	-	-	76b	KRNPKRR	-0.23	=	=	57	105w	-1.67	=	=	1	=
08	6.1 J-P	87b	11	6-5	0.94	?	-	-	-	-	-	-	-	-	-	-	-	=
09	6.2 H-Sh	46w	12	6-6	0.00	?	-	-	-	-	-	-	-	-	-	-	-	=
10	6.3 K-F	28w	16	8-8	-0.02	?	-	-	-	-	-	-	-	-	-	-	-	1-0
11	7.1 Sh-J	81w	13	7-6	11.74	?	98b	KP(4)KP	∞	1-0	-22p	1	99w	∞	1-0	21p	23	1-0
12	7.3 P-K	61w	7	3-4	0.00	=	61w	KRPKBPP	0.00	=	=	28	75w	0.35	=	=	12	=
13	7.4 F-G	47w	10	5-5	-6.95	?	-	-	-	-	-	-	-	-	-	-	-	0-1
14	9.1 G-Sh	33b	15	8-7	0.25	?	-	-	-	-	-	-	-	-	-	-	-	=
15	10.1 G-Sh	87b	9	5-4	-7.52	?	-	-	-	-	-	-	-	-	-	-	-	0-1

Table 5. WCSC visits to the 'ETZ' Endgame Table Zone.

Overall positions for a hypothetical 'WCCC/WCSC 2015 biathlon' would have been:

- 1 KOMODO 11; 2 JONNY 10½; 3= SHREDDER and PROTECTOR 9½; 5= HIARCS and GINKGO 9;
7 THE BARON 3 (as it did not participate in the WCSC); 8 MAVERICK 2½; 9 FRIDOLIN 0.

Thanks to all for their participation in both WCCC 2015 and WCSC 2015, and for post-game contributions to this commentary.

References

- de Man, R. (2013). <http://tablebase.sesse.net/syzygy/>. Site providing 5- and 6-man DTZ₅₀' EGTs.
- ICGA (2015). WCSC 2015 pgn file. https://icga.leidenuniv.nl/?page_id=1413.
- Krabbenbos, J., van den Herik, H.J. and Haworth, G.M^cC. (2015a). WCCC 2015: the 21st World Computer Chess Championship. *ICGA Journal*, Vol. 38, No. 2, pp. 103-114. <http://centaur.reading.ac.uk/39948/>.
- Krabbenbos, J., van den Herik, H.J. and Haworth, G.M^cC. (2015b). WCSC 2015: the 4th World Chess Software Championship. *ICGA Journal*, Vol. 38, No. 2, pp. 115-123. <http://centaur.reading.ac.uk/39962/>.
- MVL (2015). <http://tb7.chessok.com/probe/250/3232>. Lomonosov server of s8m DTM data.
- Nalimov, E. V., Haworth, G. M^cC., and Heinz, E. A. (2000). Space-efficient Indexing of Chess Endgame Tables. *ICGA Journal*, Vol. 23, No. 3, pp. 148-162.
- Romero, P. P. (2012). FINALGEN: download, tutorial and examples. <http://www.mtu-media.com/finalgen>.

³ FINALGEN's occasional request for 10TB of disc space are currently impractical and arise from the fact that the pawns on the board are not sufficiently advanced and/or restricted in their movement.